IN THE CLAIMS

1. (Previously Presented) An infrared light source, comprising:

one or more combiners coupled to at least a first pump laser operable to generate a first pump signal and a second pump laser operable to generate a second pump signal, the one or more combiners operable to combine the first pump signal and the second pump signal into a first optical signal, the first pump signal comprising at least a first wavelength and the second pump signal comprising at least a second wavelength, wherein the first wavelength of the first pump signal is substantially different than the second wavelength of the second pump signal; and

a wavelength shifter coupled to the one or more combiners, the wavelength shifter comprising a first waveguide structure and a second waveguide structure, the wavelength shifter operable to receive the first optical signal and to wavelength shift at least a portion of the first optical signal based at least in part on a Raman effect, wherein the wavelength shifter operates to wavelength shift at least the first wavelength to an intermediate optical wavelength in the first waveguide structure and to wavelength shift the intermediate optical wavelength to a longer optical wavelength in the second waveguide structure;

wherein at least a portion of the intermediate optical wavelength is greater than the first wavelength and wherein at least a portion of the longer optical wavelength is greater than the intermediate optical wavelength; and

wherein the first waveguide structure is substantially different than the second waveguide structure.

2. (Previously Presented) The infrared light source of Claim 1, wherein the first pump laser is selected from the group consisting of a continuous wave laser and a pulsed laser.

3. (Previously Presented) The infrared light source of Claim 1, wherein the first pump laser is selected from the group consisting of a solid state laser, a Nd:YAG laser, a Nd:YLF laser, laser diodes, a semiconductor laser, and a cladding pump fiber.

4. (Canceled)

5. (Previously Presented) The infrared light source of Claim 1, wherein the second pump laser is selected from the group consisting of a solid state laser, a Nd:YAG laser, a Nd:YLF laser, laser diodes, a semiconductor laser, and a cladding pump fiber.

6. (Previously Presented) The infrared light source of Claim 1, wherein the second pump laser comprises a plurality of laser diodes capable of generating a plurality of pump signals substantially centered on a selected wavelength.

7. (Previously Presented) The infrared light source of Claim 6, wherein the second pump laser further comprises a multiplexer capable of combining the plurality of pump signals into the second pump signal.

8. (Previously Presented) The infrared light source of Claim 7, wherein the multiplexer is selected from the group consisting of a wavelength division multiplexer, a polarization multiplexer, and a power combiner.

9. (Previously Presented) The infrared light source of Claim 1, wherein the second wavelength of the second pump signal is selected from the group consisting of 980 nm, 1310 nm, 1390 nm, 1400-1499 nm, and 1510 nm.

10. (Previously Presented) The infrared light source of Claim 1, wherein the longer optical wavelength comprises a pulsed optical signal having a pulse repetition rate in the range of two (2) hertz to one hundred (100) megahertz.

11. (Previously Presented) The infrared light source of Claim 1, wherein the longer optical wavelength comprises a pulsed optical signal having a pulse width in the range of two (2) nanoseconds to one hundred (100) milliseconds.

12. (Previously Presented) The infrared light source of Claim 1, wherein a variation of the first wavelength of the first pump signal causes a variation in the longer optical wavelength.

13. (Previously Presented) The infrared light source of Claim 1, wherein the one or more combiners are selected from the group consisting of a wavelength division multiplexer and a power coupler.

14. (Previously Presented) The infrared light source of Claim 1, wherein the first waveguide structure is selected from the group consisting of a dispersion compensating fiber, a dispersion shifted fiber, a single mode fiber, a chalcogenide fiber, and a fused silica optical fiber.

15. (Previously Presented) The infrared light source of Claim 1, wherein at least a portion of the first waveguide structure is selected from the group consisting of an optical fiber, a hollow tube waveguide, an air core waveguide, and a planar waveguide.

16. (Previously Presented) The infrared light source of Claim 1, wherein the first waveguide structure at least partially contributes to increasing an optical energy of at least a portion of the first optical signal and wherein the increased optical signal energy is communicated from the first waveguide structure at a selected wavelength.

17. (Previously Presented) The infrared light source of Claim 1, wherein at least a portion of the second waveguide structure is selected from the group consisting of an optical fiber, a hollow tube waveguide, an air core waveguide, and a planar waveguide.

18. (Canceled)

19. (Canceled)

20. (Previously Presented) The infrared light source of Claim 1, wherein at least a portion of the second waveguide structure comprises an optical fiber, wherein the optical fiber is selected from the group consisting of a mid-infrared optical fiber, a chalcogenide fiber and a ZBLAN fiber.

21. (Previously Presented) The infrared light source of Claim 1, wherein at least a portion of the second waveguide structure is an optical waveguide comprising a material selected from the group consisting of ZBLAN, sulfide, selenide, and telluride.

22. (Canceled)

23. (Previously Presented) The infrared light source of Claim 1, wherein the longer optical wavelength comprises a wavelength of approximately 1.7 microns or more.

24. (Previously Presented) The infrared light source of Claim 1, wherein the longer optical wavelength comprises a wavelength in the range of two (2) microns to ten (10) microns.

25. (Previously Presented) The infrared light source of Claim 1, wherein the longer optical wavelength comprises a wavelength in the range of five (5) microns to seven (7) microns.

26. (Previously Presented) The infrared light source of Claim 1, further comprising a wavelength separator coupled to the wavelength shifter and capable of transmitting at least a portion of a selected wavelength from the wavelength shifter.

27. (Previously Presented) The infrared light source of Claim 26, wherein the wavelength separator is selected from the group consisting of a demultiplexer, one or more partially transmissive gratings, one or more partially transmitting mirrors, one or more Fabry Perot filters and one or more dielectric gratings.

28. (Previously Presented) The infrared light source of Claim 1, further comprising at least a third waveguide structure coupled to the wavelength shifter, wherein a coupling loss between the third waveguide structure and the wavelength shifter comprises no more than five (5) decibels.

29. (Previously Presented) A method of shifting an optical wavelength to a longer optical wavelength, comprising:

combining a first pump signal generated by a first pump laser and a second pump signal generated by a second pump laser into a first optical signal, the first pump signal comprising at least a first wavelength and the second pump signal comprising at least a second wavelength, wherein the first wavelength of the first pump signal is substantially different than the second wavelength of the second pump signal;

receiving the first optical signal at a wavelength shifter, the wavelength shifter comprising a first waveguide structure and a second waveguide structure, wherein the first waveguide structure is substantially different than the second waveguide structure;

shifting at least the first wavelength to an intermediate optical wavelength using the first waveguide structure based at least in part on a Raman effect;

shifting the intermediate optical wavelength to a longer optical wavelength using the second waveguide structure; and

wherein at least a portion of the intermediate optical wavelength is greater than the first wavelength and wherein at least a portion of the longer optical wavelength is greater than the intermediate optical wavelength.

30. (Original) The method of Claim 29, wherein the second pump laser comprises a plurality of laser diodes capable of generating a plurality of pump signals substantially centered on a selected wavelength.

31. (Previously Presented) The method of Claim 30, wherein the second pump laser further comprises a multiplexer capable of combining the plurality of pump signals into the second pump signal.

32. (Previously Presented) The method of Claim 29, wherein the second wavelength of the second pump signal is selected from the group consisting of 980 nm, 1310 nm, 1390 nm, 1400-1499 nm and 1510 nm.

33. (Canceled)

34. (Canceled)

35. (Canceled)

36. (Previously Presented) The method of Claim 29, wherein the first waveguide structure at least partially contributes to increasing an optical energy of at least a portion of the first optical signal and wherein the increased optical signal energy is communicated from the first waveguide structure at a selected wavelength.

37. (Previously Presented) The method of Claim 29, wherein the longer optical wavelength comprises a wavelength of approximately 1.7 microns or more.

38. (Previously Presented) The method of Claim 29, wherein the longer optical wavelength comprises a wavelength in the range of two (2) microns to ten (10) microns.

39. (Previously Presented) The method of Claim 29, further comprising transmitting at least a portion of a selected wavelength from the wavelength shifter into a third waveguide structure.

40. (Canceled)

41. (Canceled)

42. (Canceled)

43. (Canceled)

44. (Canceled)

45. (Canceled)

46. (Canceled)

47. (Canceled)

48. (Canceled)

49. (Canceled)

50. (Canceled)

51. (Canceled)

52. (Previously Presented) The method of Claim 29, wherein the first waveguide structure is selected from the group consisting of a dispersion compensating fiber, a dispersion shifted fiber, a single mode fiber, a chalcogenide fiber, and a fused silica optical fiber.

53. (Previously Presented) The method of Claim 29, wherein the second waveguide structure is selected from the group consisting of a chalcogenide fiber and a ZBLAN fiber.

54. (Previously Presented) The method of Claim 29, wherein at least a portion of the second waveguide structure is an optical waveguide comprising a material selected from the group consisting of ZBLAN, sulfide, selenide, and telluride.

55. (Previously Presented) The infrared light source of Claim 1, wherein the longer optical wavelength is adapted for use in a diagnostic procedure to detect tissue abnormalities.

56. (Previously Presented) The infrared light source of Claim 1, wherein the longer optical wavelength is further coupled to a medical device adapted for insertion into a patient's body through an orifice in the body.

57. (Previously Presented) The infrared light source of Claim 1, wherein the longer optical wavelength is adapted for use to ablate tissue with reduced collateral damage.

58. (Previously Presented) The infrared light source of Claim 1, wherein the longer optical wavelength is adapted for use in a differential spectroscopic measurement based at least in part on a comparison of measurements taken from different portions of a sample.

59. (Previously Presented) The infrared light source of Claim 1, wherein the longer optical wavelength is adapted for use in a measurement based at least in part on a comparison of a plurality of wavelengths transmitted through a sample.

60. (Previously Presented) The method of Claim 29, wherein the longer optical wavelength is adapted for use in a diagnostic procedure to detect tissue abnormalities.

61. (Previously Presented) The method of Claim 29, wherein the longer optical wavelength is further coupled to a medical device adapted for insertion into a patient's body through an orifice in the body.

62. (Previously Presented) The method of Claim 29, wherein the longer optical wavelength is adapted for use to ablate tissue with reduced collateral damage.

63. (Previously Presented) The method of Claim 29 wherein the longer optical wavelength is adapted for use in a differential spectroscopic measurement based at least in part on a comparison of measurements taken from different portions of a sample.

64. (Previously Presented) The method of Claim 29, wherein the longer optical wavelength is adapted for use in a measurement based at least in part on a comparison of a plurality of wavelengths transmitted through a sample.